

AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below. A listing of all pending claims is presented below.

1. (Original) A field effect transistor formed in a semiconductor layer which has a strain effect and which is formed in an upper layer of a semiconductor substrate, said field effect transistor comprising:

a source/a drain formed only in said semiconductor layer having the strain effect.

2. (Original) A field effect transistor according to claim 1, wherein said semiconductor layer having the strain effect comprises a silicon layer having a strain effect.

3. (Original) A field effect transistor according to claim 2, further comprising:

silicon epitaxial layers formed on said source/drain; and

refractory metal silicide layers formed on said silicon epitaxial layers.

4. (Original) A field effect transistor according to claim 2, wherein said semiconductor substrate comprises:

a silicon base;

a buffer layer formed on said silicon base, said buffer layer being made from silicon germanium in which the concentration of germanium is changed in the thickness direction;

a relax layer formed on said buffer layer, said relax layer being made from silicon germanium whose stress is relaxed; and

a silicon layer formed on said relax layer, said silicon layer having a strain effect.

5. (Original) A field effect transistor according to claim 3, wherein said semiconductor substrate comprises:

a silicon base;

a buffer layer formed on said silicon base, said buffer layer being made from silicon germanium in which the concentration of germanium is changed in the thickness direction;

a relax layer formed on said buffer layer, said relax layer being made from silicon germanium whose stress is relaxed; and

a silicon layer formed on said relax layer, said silicon layer having a strain effect.

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Original) A semiconductor device comprising:

a p-channel type field effect transistor and an n-channel type field effect transistor both formed in a semiconductor layer which has a strain effect and which is formed in an upper layer of a semiconductor substrate,

wherein a source/a drain of said p-channel type field effect transistor and a source/a drain of said n-channel type field effect transistor are formed only in said semiconductor layer having the strain effect.

10. (Original) A semiconductor device according to claim 9, wherein said semiconductor layer having the stain effect comprises a silicon layer having a strain effect comprises a silicon layer having a strain effect.

11. (Original) A semiconductor device according to claim 10, wherein each of said p-channel type field effect transistor and said n-channel type field effect transistor comprises:
silicon epitaxial layers formed on said source/drain; and
refractory metal silicide layers formed on said silicon epitaxial layers.

12. (Original) A semiconductor device according to claim 10, wherein said semiconductor substrate comprises:
a silicon base;
a buffer layer formed on said silicon base, said buffer layer being made from silicon germanium in which the concentration of germanium is changed in the thickness direction;
a relax layer formed on said buffer layer, said relax layer being made from silicon germanium whose stress is relaxed; and
a silicon layer formed on said relax layer, said silicon layer having a strain effect.

13. (Original) A semiconductor device according to claim 11, wherein said semiconductor substrate comprises:

a silicon base;

a buffer layer formed on said silicon base, said buffer layer being made from silicon germanium in which the concentration of germanium is changed in the thickness direction;

a relax layer formed on said buffer layer, said relax layer being made from silicon germanium whose stress is relaxed; and

a silicon layer formed on said relax layer, said silicon layer having a strain effect.

14. (Canceled)

15. (Cancelled)

16. (Canceled)

17. (Original) A semiconductor substrate comprising:

a germanium base;

a relax layer formed on said germanium base, said relax layer being composed of a silicon germanium layer whose stress is relaxed; and

a silicon formed on said relax layer, said silicon layer having a strain effect.

18. (Original) A field effect transistor according to claim 2, wherein said semiconductor substrate comprises:

a germanium base;
a relax layer formed on said germanium base, said relax layer being composed of a silicon germanium layer whose stress is relaxed; and
a silicon formed on said relax layer, said silicon layer having a strain effect.

19. (Original) A field effect transistor according to claim 3, wherein said semiconductor substrate comprises:

a germanium base;
a relax layer formed on said germanium base, said relax layer being composed of a silicon germanium layer whose stress is relaxed; and
a silicon formed on said relax layer, said silicon layer having a strain effect.

20. (Original) A semiconductor device according to claim 10, wherein said semiconductor substrate comprises:

a germanium base;
a relax layer formed on said germanium base, said relax layer being composed of a silicon germanium layer whose stress is relaxed; and
a silicon formed on said relax layer, said silicon layer having a strain effect.

21. (Original) A semiconductor device according to claim 11, wherein said semiconductor substrate comprises:

a germanium base;

a relax layer formed on said germanium base, said relax layer being composed of a silicon germanium layer whose stress is relaxed; and

a silicon formed on said relax layer, said silicon layer having a strain effect.

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (New) A semiconductor device, comprising

a semiconductor substrate having a buffer layer on a silicon base layer, wherein the buffer layer is made of a P⁺ type silicon germanium,

a relax layer on the buffer layer, wherein the relax layer is made of P⁺ type silicon germanium which is relaxed, and

a silicon strain effect layer on the relax layer;

a gate electrode of a p-channel type field effect transistor and a gate electrode of a n-channel type field effect transistor on said strain effect silicon layer through a gate insulating film;

a source and a drain each composed of p-type diffusion layer only in said silicon strain effect layer on both sides of said gate electrode of said p-channel type field effect transistor, the source and drain of the p-type diffusion layers being formed to a depth of less than a depth of the strain effect silicon layer;

a source and a drain each composed of n-type diffusion layer only in said strain effect silicon layer on both sides of said gate electrode of said n-channel type field effect transistor, the source and drain of the n-type diffusion layers being formed to a depth of less than a depth of the strain effect silicon layer; and

an isolation region in between the p-channel type field effect transistor and the n-channel type field effect transistor in said strain effect silicon layer.

30. (New) The semiconductor device according to claim 29, wherein the buffer layer is constructed of $\text{Si}_{1-x}\text{Ge}_x$, wherein a concentration of germanium of the buffer layer changes from $X=0.04$ to $X=0.3$ from a side of the buffer layer opposite to the relax layer to a side of the buffer layer proximate the relax layer.

31. (New) The semiconductor according to claim 29, wherein the relax layer is formed of $\text{Si}_{1-x}\text{Ge}_x$, wherein a concentration of germanium of the relax layer is $X=0.3$.

32. (New) A semiconductor device, comprising:

a semiconductor substrate having a silicon layer having a strain effect in an upper layer of said semiconductor substrate, a relax layer below the silicon layer having the strain effect, and a buffer layer below the relax layer;

a gate electrode of a p-channel type field effect transistor on said strain effect silicon layer through a gate insulating film;

a source and a drain each composed of p-type diffusion in only said strain effect silicon layer on both sides of said gate electrode of said p-channel type field effect transistor, the source and drain of the p-type diffusion layers being formed to a depth of less than a depth of the strain effect silicon layer;

a source and a drain each composed of n-type diffusion layer in only said strain effect silicon layer on both sides of said gate electrode of said n-channel type field effect transistor, the source and drain of the n-type diffusion layers being formed to a depth of less than a depth of the strain effect silicon layer;

an isolation region in between the p-channel type field effect transistor and the n-channel type field effect transistor in said silicon layer having the strain effect;
and

wherein the buffer layer is constructed of a P⁺ type silicon germanium, wherein the relax layer is made from a P⁺ type silicon germanium whose stress is relaxed.

33. (New) The semiconductor device of claim 32, wherein the semiconductor substrate includes:

the buffer layer located on a silicon base layer;

a relax layer on the buffer layer; and

the silicon strain effect layer on the relax layer on the buffer layer.

34. (New) The semiconductor of claim 33, wherein the relax layer is formed of n-type silicon germanium.

35. (New) The semiconductor of claim 33, wherein the relax layer is formed of n-type silicon germanium.

36. (New) The semiconductor of claim 32, wherein a semiconductor substrate having the strain effect silicon layer causes the strain effect silicon layer to exhibit a strain effect in the range of 5 nm to 30 nm.

37. (New) The semiconductor according to claim 32, wherein the buffer layer is constructed of $\text{Si}_{1-x}\text{Ge}_x$, wherein a concentration of germanium of the buffer layer proximate the relax layer changes from $X=0.04$ to $X=0.3$ from a side of the buffer layer proximate the relax layer.

38. (New) The semiconductor according to claim 32, wherein the relax layer is formed of $\text{Si}_{1-x}\text{Ge}_x$ wherein a concentration of germanium of the relax layer is $X=0.3$.